absolute motion, even though we may be unable experimentally to determine the absolute motion; the change of mass and of length which arise in moving systems are then but the natural consequences of the redistribution of the lines of force issuing from the moving charges; our concept of time and distance is no longer in need of modification; we have essentially the original Lorentz point of view. The theory of relativity then is merely a collection of results interpreted on moving axes (with local time) and abstracted from the underlying ether; the fundamental postulate M of the theory, that we can not detect absolute motion, is a natural consequence of the fact that the transformations between different sets of moving axes (and times) form a group. For instance, if two particles move in different directions through the ether each is actually shortened in the direction of motion, but observers attached to the particles can observe no shortening because everything in the system is similarly shortened. And moreover, since the transformations above mentioned form a group, each observer, abstracting from any conception of the ether and experimentally unaware of any shortening in his system, concludes that the system of the other observer is shortened in the direction of their relative motion and by the amount appropriate thereto.

On the other hand, if we take the point of view that what we can not directly observe does not exist, if we take the theory of relativity as itself fundamental and banish the ether, then we have no such physical or conceptual basis upon which to explain the shortening, the alterations in mass, or the changes in time, and we are forced to change our concepts of mass, length and time; we are forced to all those new ideas which the theory of relativity brings in and which seem incongruous or bizarre to many persons, and these ideas assume a semblance of naturalness only when our universe is interpreted as four-dimensional with space and time unified and inherently interrelated, in the manner adopted by Minkowski or Wilson and Lewis or McLaren. Which of the two points of view we adopt depends largely upon our turn of mind. There are philosophers who feel that we are entirely free to construct for ourselves any image of the physical universe which seems most natural and easy; they will probably hold to the ether as long as possible. There are others who feel that we should not intrude into the image any ideas which represent things not immediately subject to experiment; they will declare for the principle of relativity as fundamental and not as derived, just as Walther Ritz declared against electric and magnetic field-intensities E and H.

The author knows all this and covers most of it in different parts of his work, but seems nowhere to collect it. The brief discussion of the mass of light is too indefinite to convey any useful impression to me. The attempt at the end of the work to outline a further experiment bearing on the theory is laudable in itself and shows that the author has thought deeply into his subject from other sides than the logical.

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Osmotic Pressure. By Alexander Findlay. Longmans, Green and Co., New York. Cloth, 8vo. Pp. 84. Price $1.00.

This book by Dr. Findlay is one of the series of monographs on inorganic and physical chemistry of which he is the editor. The purpose of these monographs is "to place before advanced students of chemistry, accounts of certain sections of inorganic and physical chemistry fuller and more extended in scope than can be obtained in ordinary text-books." The present monograph deals with semi-permeable membranes and osmotic pressure, 6 pages; van't Hoff's theory of dilute solutions, 4 pages; direct determination of osmotic pressure of concentrated solutions, 12 pages; discussion of the recent determinations of osmotic pressure and of the van't Hoff theory, 4 pages; the general theory of ideal solutions, 10 pages; discussion of the osmotic pressure of aqueous solutions of cane sugar in the light of the theory of ideal solutions, 13 pages; indirect determinations of the osmotic pressure, 15 pages; views regarding the cause of osmosis

and the action of the semi-permeable membrane, 12 pages. Three pages are devoted to references. Two figures appear in the text. The treatment does not claim to be exhaustive "so far as concerns work important in its time but now only of historical interest," the aim being to give special attention to recent investigations.

The amount of space devoted to thermodynamical considerations and the so-called theory of "ideal" solutions, together with the mode of treatment and what one reads between the lines, clearly shows the author's leanings. It is, however, quite safe to say that those who have actually spent their time in the laboratory at practical work with innumerable solutions and diverse osmotic membranes, entertain very little hope of a better understanding of solutions and osmosis from thermodynamical computations and mathematical equations of what are termed "ideal solutions." One might indeed about as well talk of an ideal chemical compound, an ideal plant, or an ideal animal, as of an ideal solution.

The monograph will doubtless prove useful to students of the subject of osmosis, especially because of the references to the recent literature, even though these be incomplete. It moreover also contains a good, clear exposition of the existing physical theories of osmosis and solutions. But in a publication of this kind, which is especially intended for students, one has a right to expect something that will inspire and spur the student on to further experimental inquiry in the subject. In this respect, however, the monograph is sadly lacking, and how can it be otherwise, for to those that seek to solve the problem by thermodynamics and theories of "ideal solutions" new experiments along specific lines naturally do not suggest themselves, for they are really not required for the purpose of the explanation. A theory of "ideal solutions" suggests chiefly how known facts can be harmonized with it and how the "troublesome exceptions" may be accounted for; it does not suggest how new fields may be opened up. To those that thus vainly hope to solve the practical problems of solutions and osmosis particularly as they relate to organic beings, one may well quote the immortal words of Goethe, "Grau teurer Freund ist alle Theorie und grün des Lebens goldener Baum."

LOUIS KAHLENBERG

THE BOTANICAL SOCIETY OF AMERICA

THE eighth annual meeting of the Botanical Society of America was held in the State Capitol Building, at Atlanta, Georgia, December 30, 1913, to January 1, 1914, about ninety members being present. The following officers were elected:

President—A. S. Hitchcock, U. S. Department of Agriculture.

Vice-president—B. M. Duggar, Missouri Botanical Garden.

Councilor—D. G. Fairchild, U. S. Department of Agriculture.

One hundred and thirty new members were elected to the society.

The report from the committee on the new journal was adopted. This provides for a co-operative arrangement with the Brooklyn Botanic Garden which will make possible the immediate publication of the journal and the first number of the *American Journal of Botany* will appear during January. All members of the society become contributing subscribers to the *Journal*, the price being fixed at $3.00 annually to members and $4.00 to non-members. Attention is called to the fact that candidates for membership (meaning those whose applications were received too late for action or those who may apply for membership during the year) may, upon approval of the council, receive the journal at the same rate as members.

The address of retiring President L. R. Jones on "Problems and Progress in Plant Pathology," together with the symposium on "Temperature Effects," participated in by Dr. Frederick Barry, Dr. B. M. Duggar, Dr. D. T. MacDougal and Dr. Forrest Shreve, will probably be published in the new journal of the society.

The dinner for all botanists was held New Year's night, the topic for discussion being the new journal.

Following are abstracts of the papers presented at the general sessions and at the newly organized physiological section:

The Seasonal Life History of Some Red Algæ: I. F. LEWIS.

Experiments were performed at Woods Hole dur-